XXXIV. *Astronomical Observations made by* Samuel Holland, *Esquire, Surveyor-General of Lands for the Northern District of* North-America ; *and Others of his Party. Communicated by the Astronomer Royal.*

Obf. of Lat.

MARCH 8, 1769, obferved by Samuel Holland, Efquire, at his houfe, bearing fouth, 56° weft from Quebec, diftance from the caftle of St. Lewis 2½ miles, with Bird's aftronomical quadrant, the latitude, viz.

	°	′	″
Zenith angle of the Sun's upper limb	51	4	0
Deduct for the Sun's fouthern declination	4	34	31
	46	29	29
Add the Sun's femi-diameter		16	9
Ditto refraction		1	42
North latitude by obfervation	46	47	20

Obf. of Long. March 11, 1769, obferved by the fame at the fame place, with Dollond's refracting telefcope, an immerfion of the firft fatellite of Jupiter, at 15 hours, and 45 feconds, mean or equal time.

Obf.

Obſ. of Lat.   March 19, 1769, obſerved by the ſame at the ſame place, with Bird's aſtronomical quadrant, the latitude, viz.

	o	′	″
Zenith angle of the Sun's upper limb	46	45	2
Deduct for the Sun's ſouthern declination }		14	42
	46	30	20
Add the Sun's ſemi-diameter		16	6
Ditto refraction			50
North latitude by obſervation	46	47	16

Obſ. of Lat.   March 20, 1769, obſerved by the ſame, at the ſame place, with the ſame inſtrument, the latitude, videlicet,

	o	′	″
Zenith angle of the Sun's upper limb	46	21	16
Add the Sun's northern declination		8	58
Ditto the Sun's ſemi-diameter		16	$5\frac{1}{2}$
Ditto the refraction		1	0
North latitude by obſervation	46	47	$19\frac{1}{2}$

N. B. Six more obſervations of the latitude have been taken. The mean reſult of the whole is } 46 47 15

Obſ. of Long.   April 3, 1769, obſerved by the ſame, at the ſame place, with Dollond's refracting teleſcope, an immerſion of the firſt ſatellite of Jupiter, at 15 hours, 10 minutes, and 22 ſeconds, mean or equal time.

Obſ. of Long.   April 18, 1769, obſerved by the ſame, at the ſame place, with the ſame inſtrument, an immerſion of the ſecond ſatellite of Jupiter, at 12 hours, 39 minutes, and 36 ſeconds, mean or equal time.

Obſ. of Long.   April 19, 1769, obſerved by the ſame, at the ſame place, with the ſame inſtrument, an immerſion of the firſt ſatellite of Jupiter, at 13 hours, 26 minutes, and 27 ſeconds, mean or equal time.

Obſ.

Obf. of Long. May 28, 1769, obferved by the fame, at the fame place, with the fame inftrument, an emerfion of the firft fatellite of Jupiter, at 14 hours, 2 minutes, and 40 feconds, mean or equal time. Alfo, obferved by the fame, at the fame place, with the fame inftrument, a fuperior conjunction of the fourth fatellite of Jupiter, at 11 hours, 14 minutes, and 17 feconds, mean or equal time; and it entirely difappeared at 11 hours, 24 minutes, and 3 feconds, mean or equal time.

Obf. of Tranf. June 3, 1769, obferved, by the fame, at the fame place, with the fame inftrument, the Tranfit of Venus, as follows : at 2 hours, 28 minutes, and $1\frac{1}{2}$ feconds, perceived a luminous point on the lower part of the Sun's limb, by appearance ; and, in the fame place, $1\frac{1}{2}$ feconds afterwards, the firft external contact was formed, which rectified as the clock or time-piece of Graham was 15 feconds too faft at the time of obfervation (as proved by equal altitudes of the Sun taken with Bird's aftronomical quadrant, on the 1ft, 2d, 4th, and 5th inftant) the equal or mean time of obferving the firft external contact will be at 2 hours, 27 minutes, and 48 feconds. Mr. St. Germain, of the feminary of Quebec, obferved the fame contact, at the fame inftant, with Short's 2 feet reflecting telefcope. Clouds, intervening, prevented the obfervation of the firft internal contact : but at 6 o'clock the Planet might be feen with the naked eye on the Sun's difc, through the hazinefs of the atmofphere.

Obf. of Long. June 6, 1769, obferved by the fame, at the fame place, with the fame inftrument, an emerfion of the firft fatellite of Jupiter, at 10 hours, 26 minutes, and 22 feconds, mean or equal time.

Obf. of Lat. January 2, 1768, obferved by Enfign George Sproule, of the 59th regiment of foot, on the fouth point, at the entrance of the bafon of Gafpée, with Hadley's quadrant, and an artificial horizon, the latitude, viz.

	o	,	,,
Double angle of the meridian altitude of the Sun's center }	36	38	0

Apparent altitude of the Sun's center	18	19	0
Refraction		2	41

True altitude of the Sun's center	18	16	19
	90	0	0

Sun's zenith diſtance . . .	71	43	41
Sun's declination reduced to the meridian of Gaſpée }	22	56	10

North latitude by obſervation	48	47	31

Obſ. of Lat. May 9, 1768, obſerved by the ſame, at the ſame place, with the ſame inſtrument, and an artificial horizon, the latitude, videlicet,

	o	,	,,
Double angle of the Sun's lower limb, meridian altitude }	117	6	0
Add for adjuſting the quadrant, error to the right, }		2	10

	117	8	10

Apparent altitude of the Sun's lower limb }	58	34	5
Add the Sun's ſemi-diameter		15	53

Apparent altitude of the Sun's center	58	49	58
Deduct for Refraction			53

True altitude of the Sun's center	58	49	25
	90	0	0

Sun's zenith diſtance	31	10	35
Add the Sun's declination, reduced to the meridian of Gaſpée }	17	36	56

North latitude by obſervation	48	47	31

Obf. of Lat. May 15, 1768, obferved by the fame, at the fame place, with the fame inftrument, and an artificial horizon, the latitude, viz.

	°	′	″
Double angle of the Sun's upper limb, meridian altitude	121	10	0
Subtract for adjufting the quadrant error to the left			35
	121	9	25
Apparent altitude of the Sun's upper limb	60	34	42
Subtract the Sun's femi-diameter		15	51
Apparent altitude of the Sun's center	60	18	51
Subtract for refraction			31
True altitude of the Sun's center	60	18	20
	90	0	0
Sun's zenith diftance	29	41	40
Add Sun's declination reduced to the meridian of Gafpée	19	5	50
North latitude by obfervation	48	47	30

N. B. There were 12 more obfervations made of the latitude, by the fame perfon ; but thefe are judged fufficient to fhew his manner of operation : but the refult of the whole 15 make the place of obfervation 48° 47′ 32″ north latitude.

Obf. of Long. January 29, 1768, obferved by the fame perfon, at the fame place, with Short's two feet reflecting telefcope, an immerfion of the firft fatellite of Jupiter, at 14 hours, 11 minutes, and 3 feconds, mean or equal time.

Obf. of Long. March 15, 1768, obferved by the fame perfon, at the fame place, with the fame inftrument, an immerfion of the firft fatellite of Jupiter, at 14

K k 2   hours,

hours, 29 minutes, and 38 seconds, equal or mean time.

Obs. of Long.   March 16, 1768, observed by the same, at the same place, with the same instrument, an immersion of the second satellite of Jupiter, at 12 hours, 7 minutes, and 16 seconds, equal or mean time.

Obs. of Long.   March 16, 1768, observed an immersion of the third satellite of Jupiter, at 13 hours, 38 minutes, and 18 seconds, equal or mean time; by the same person, with the same instrument, at the same place.

Obs. of Long.   April 9, 1768, observed by the same person, at the same place, with the same instrument, an emersion of the first satellite of Jupiter, at 11 hours, 19 minutes, and 24 seconds, equal or mean time.

Obs. of Long.   April 10, 1768, observed by the same person, at the same place, with the same instrument, an emersion of the second satellite of Jupiter, at 11 hours, 38 minutes, and 45 seconds, equal or mean time.

Obs. of Long.   April 25, 1768, observed by the same person, at the same place, with the same instrument, an emersion of the first satellite of Jupiter, at 9 hours, and 37 minutes, equal or mean time.

N. B.   This observation is thought to be as exact as possible, the satellite emerging totally in an instant, and the clock being truly regulated by a number of single and corresponding altitudes.

Obs. of Long.   May 9, 1768, observed by the same person, at the same place, with the same instrument, an emersion of the first satellite of Jupiter, at 13 hours, 26 minutes, and 47 seconds, equal or mean time.

Obs. of Long.   May 12, 1768, observed by the same person, at the same place, with the same instrument, an emersion of the second satellite of Jupiter, at 11 hours, 11 minutes, and 34 seconds, equal or mean time.

Samuel Holland.